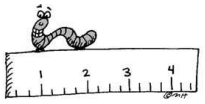
Name: _____ Date: _____ Period: _____



CP PS Unit 8A: Motion

Distance and Displacement Practice Worksheet

Indicator

PS-5.1: Explain the relationship among distance, time, direction, and velocity of an object.

Objectives

- Compare and contrast distance and displacement.
- Use a graph to determine distance and displacement of an object.
- Use the correct units for distance and displacement.
- Demonstrate a scenario where the displacement of an object is zero, but the distance is not.

Part I

Use the graph paper to draw each scenario. Fill in the correct information for distance and displacement using the correct units. The first example has been completed for you. Use this as a guide to complete the rest of the table. Assume that 1 square = 1 meter.

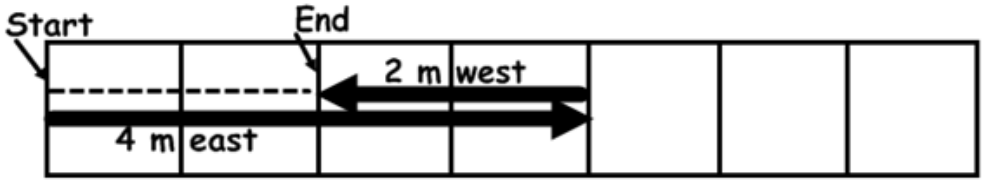
_____=total meters traveled

_____=distance traveled from starting point to ending point, ignoring the journey in-between. If the journey is NOT a straight line, simply draw an arrow (vector) from the starting point to the ending point and measure the length of the arrow. Don't forget to include the DIRECTION.

_____= _____+ _____

	First Move	Second Move	Distance (m)	Displacement
1	Move 4 meters east	Move 2 meters west	6	2 m east
2	Move 4 meters north	Move 2 meters south		
3	Move 2 meters east	Move 4 meters west		
4	Move 5 meters east	Move 5 meters west		
5	Move 5 meters south	Move 2 meters north		
6	Move 10 meters west	Move 3 meters east		
7	Move 3 meters east	Move 4 meters north		
8	Move 6 meters east	Move 8 meters south		
9	Move 9 meters north	Move 12 meters west		

Example 1: Distance = 4m + 2m = <u>6 m total distance traveled</u>
Displacement = <u>2 m east</u> (net distance from start to end, includes net direction)



N

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Word Problems for Distance and Displacement

1. A truck travels to and from a stone quarry that is located 2.5 km to the east.

   What is the total distance traveled by the truck? _____

   What is its displacement? _____

   Explain with a diagram:

2. A whale swims due east for a distance of 6.9 km, turns around and goes due west for 1.8 km, and finally turns around again and heads 3.7 km due east.

   What is the total distance traveled by the whale? _____

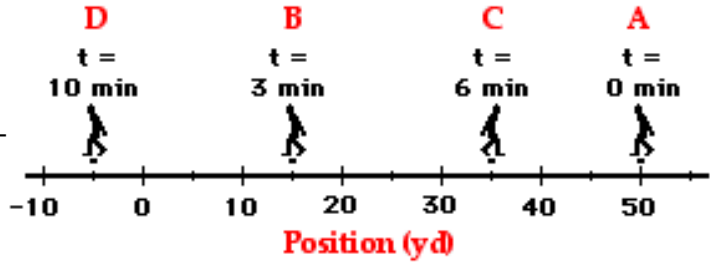
   What is the displacement of the whale? _____

   Explain with a diagram:

3. A football coach paces back and forth along the sidelines during a close rivalry game. The diagram below shows several of the coach's positions and various times. At each marked position, the coach makes a "U-turn" and moves in the opposite direction. In other words, the coach moves from position A to B to C to D.

   What is the total distance that the coach traveled? _____

   What is the coach's final displacement? _____



4. Two runners race each other around a circular track. The track is 500 meters long and 159 m across (the diameter of the circle). Runner A trips at the half-way mark and doesn't get up. Runner B finishes the race.

   Which runner has the greater displacement? _____m

   Which ran the greatest distance? _____m

   Is there a difference? Explain with a diagram:

5. Two cars start at the same point and drive in a straight line for 5 km. At the end of the drive their distances are the same but their displacements are different. **Explain** how this could happen. Illustrate with a **diagram.**

6. Write a word problem below that describes an object with a distance greater than zero, but a final displacement that is equal to zero. Draw a diagram that illustrates the word problem. Make sure you have the correct units for displacement and distance.